

No. 810,818.

PATENTED JAN. 23, 1906.

T. STEVENSON.
MACHINE FOR BENDING METAL BARS.
APPLICATION FILED MAY 20, 1903.

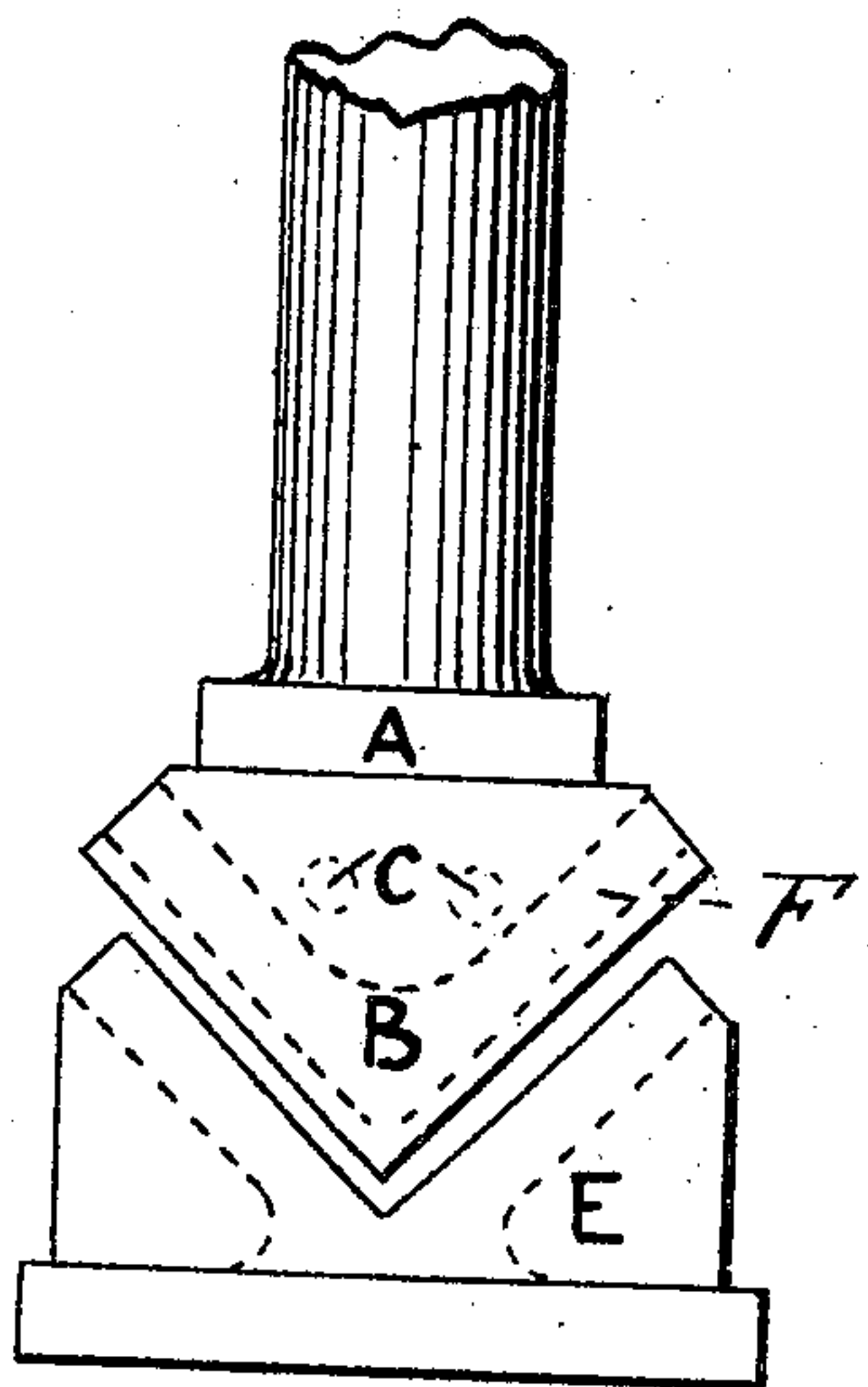


FIG 1

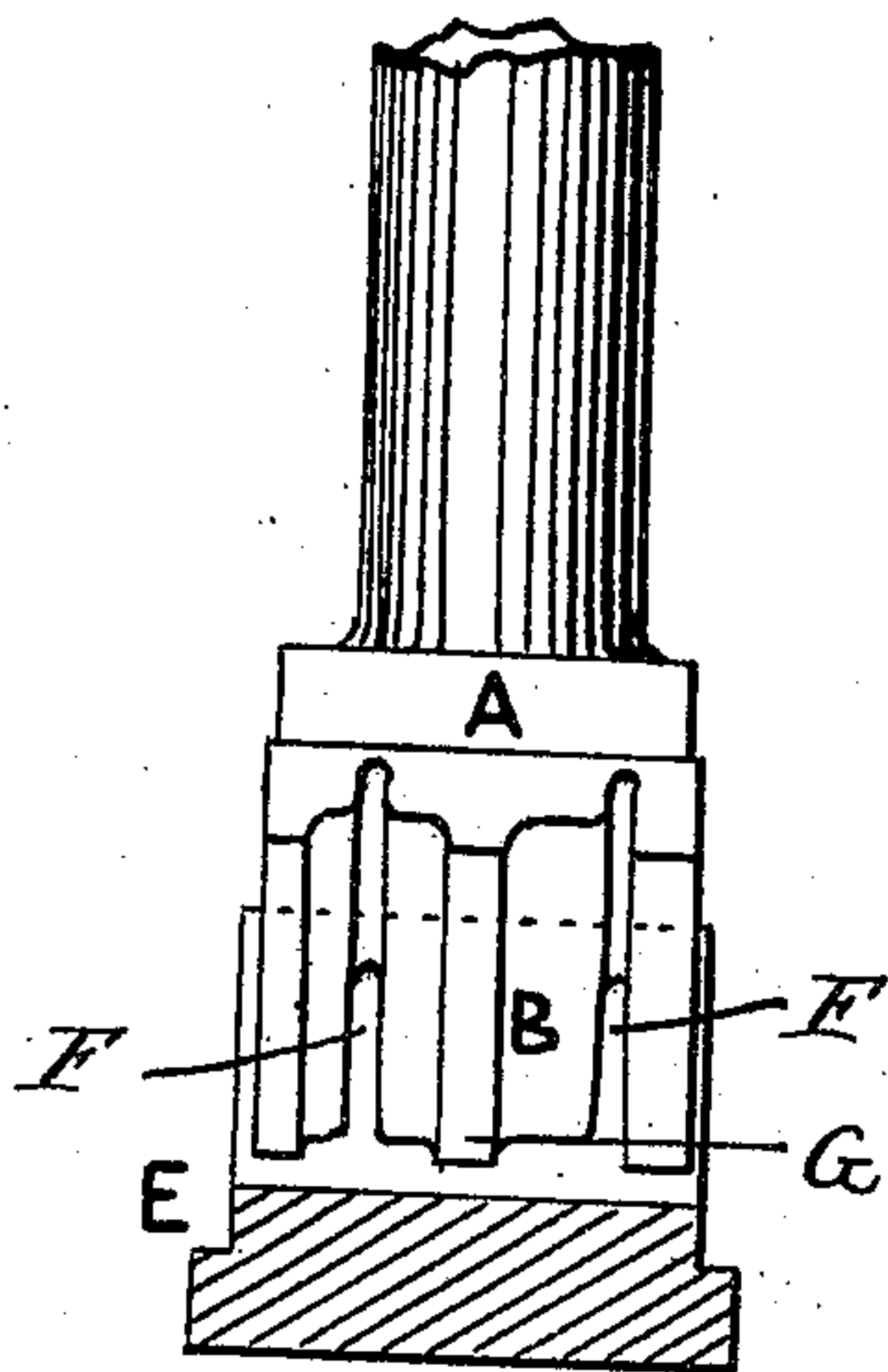


FIG 2

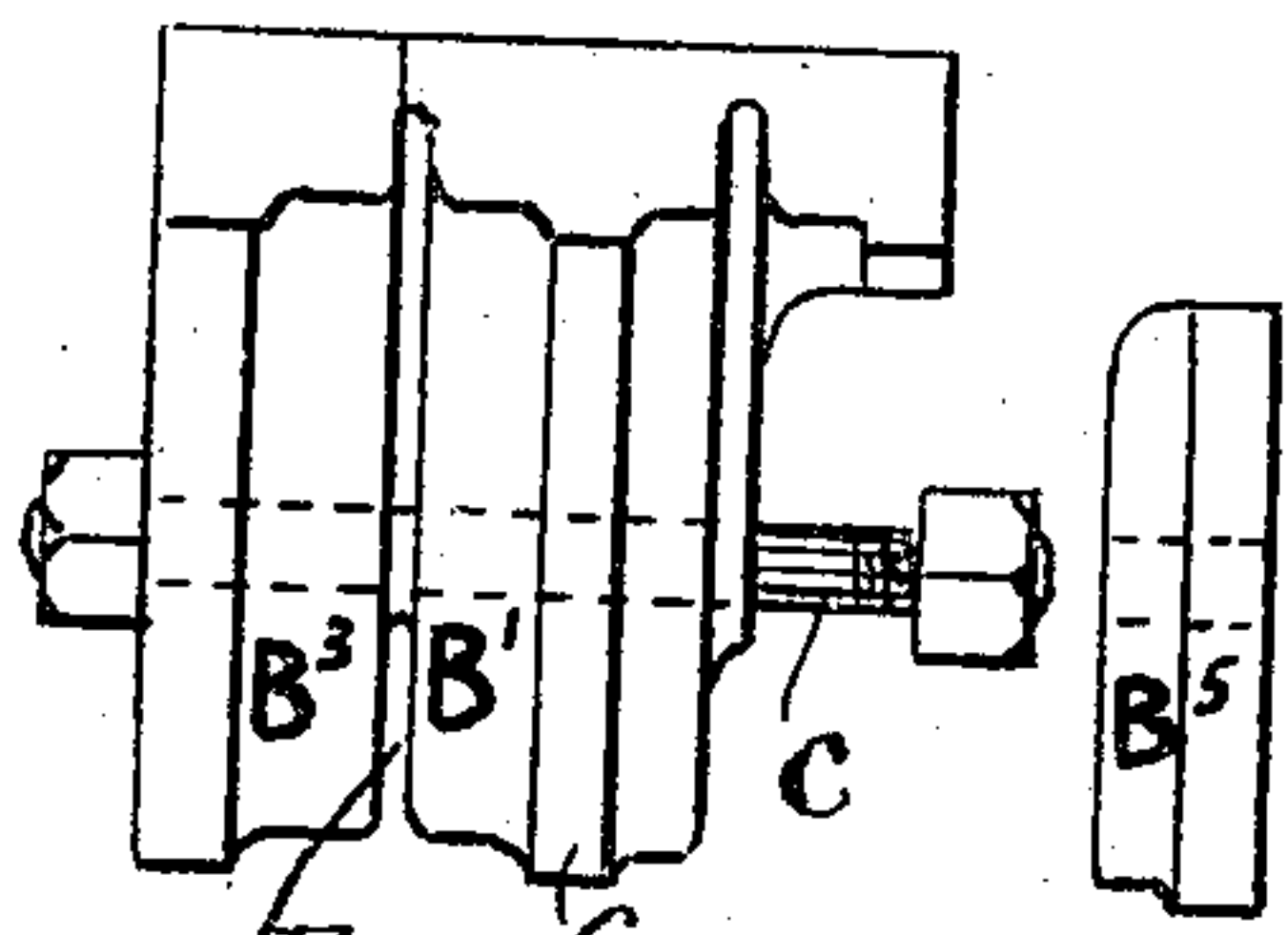


FIG 3

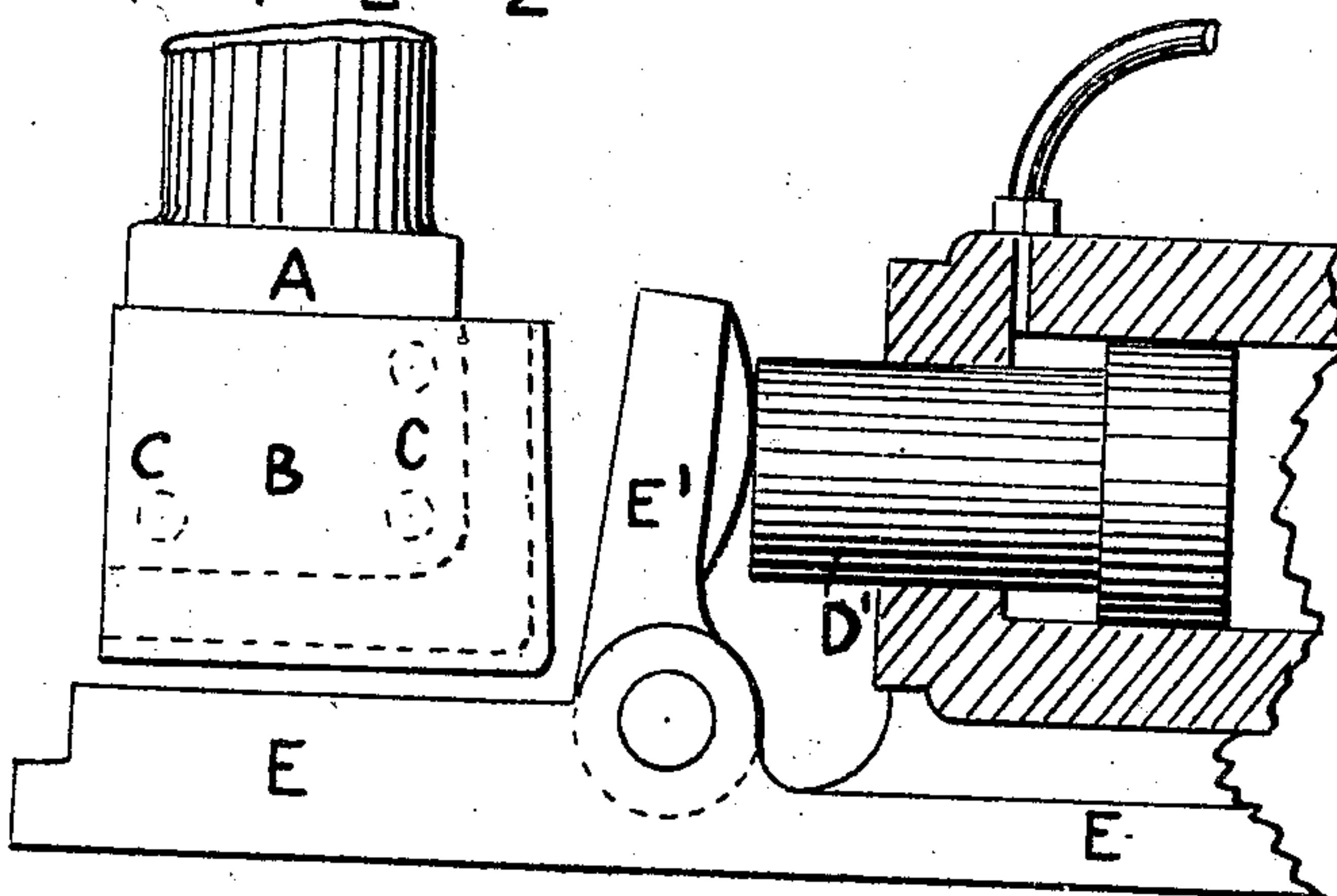


FIG 5

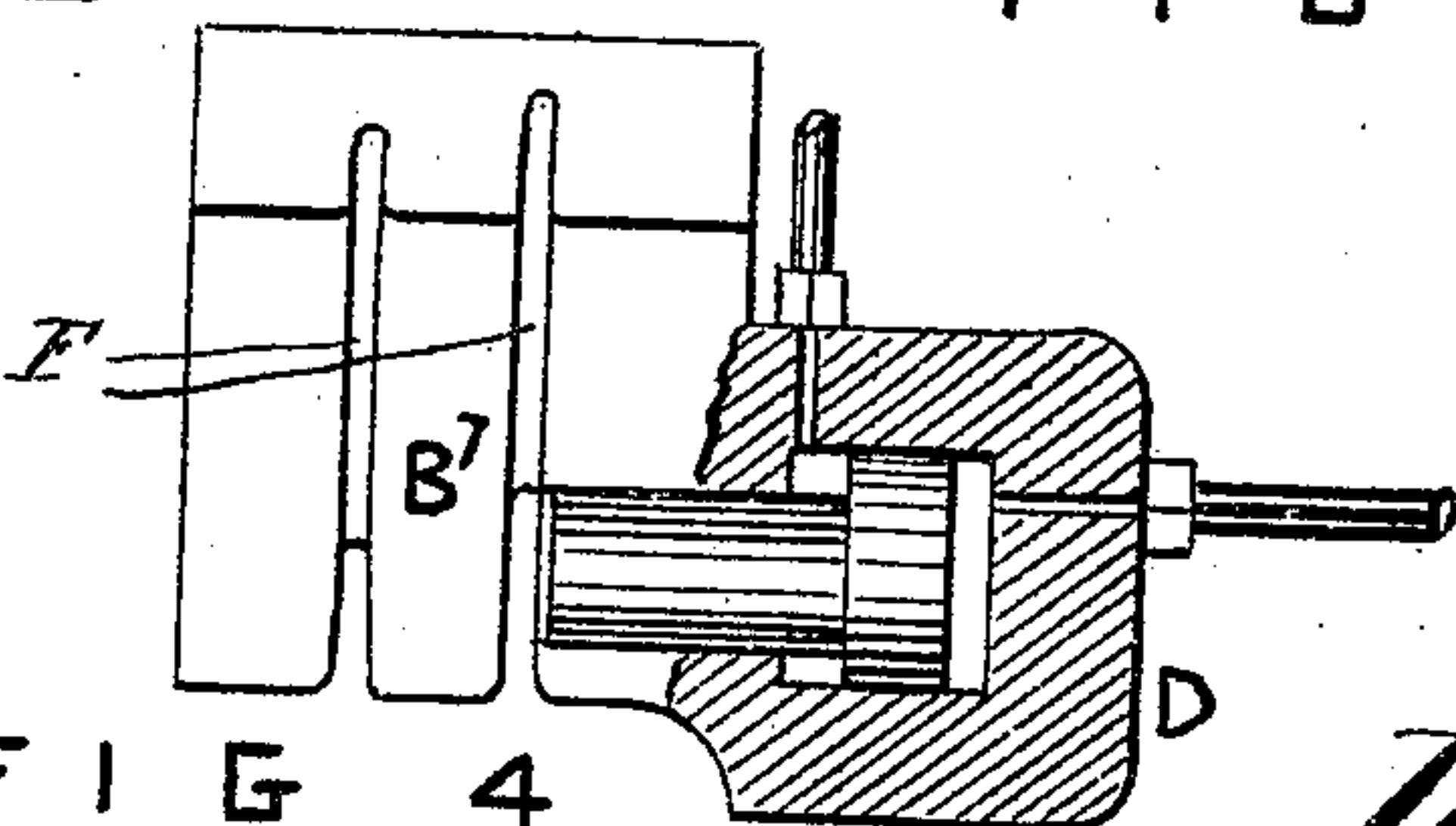


FIG 4

Witnesses:
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UNITED STATES PATENT OFFICE.

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MACHINE FOR BENDING METAL BARS.

No. 810,818.

Specification of Letters Patent.

Patented Jan. 23, 1906.

Application filed May 20, 1903. Serial No. 158,055.

To all whom it may concern:

Be it known that I, THOMAS STEVENSON, a subject of the King of Great Britain, residing at 49 Moray Place, in the city of Dunedin, in the British Colony of New Zealand, have invented certain new and useful Improvements in Machines for Bending Metal Bars, of which the following is a specification.

This invention relates to metal-bending.

10 The object of the invention is without the removal of stock in the formation of metallic articles having sharp or angular bends to bend bars—such as angle, T, or channel
15 irons—sharply at right angles or even slightly to more than right angles at one operation. Heretofore when such bars have been bent as described they have had the web nicked and either a V-shaped piece inserted or cut out, as needed, according as to
20 whether the bend or angle be on the outer or inner side of the web of the bar. Under the present procedure the die members are formed with a slightly-increased spacing to allow the web to gather when employed for
25 forming inner angles, as shown. When, however, either from the depth of the web, the acuteness of the angle, or other cause the web might gather unevenly or buckle, the sides of the male die or block may be loose
30 and removable for allowing the web to be swaged or merely relieved, or else a press acting laterally could press the web for inner angles or strain the web for outer angles.

In the accompanying drawings, forming a
35 part of this specification, and in which like characters of reference indicate corresponding parts, Figure 1 is a view in front elevation of a pair of dies or blocks for pressing or forming bars at right angles. Fig. 2 is a view
40 in end elevation with the lower die or block in section. Fig. 3 is a sectional end view of an upper die or block. Fig. 4 is a view of a modified form of apparatus having means for compressing the web laterally when bent.
45 Fig. 5 is a view of another modification in which the dies or blocks act laterally.

Referring to the drawings, A designates a pressure-exerting member, which may be in the nature of an arm having sufficient power
50 to press the bars to the desired angle.

B is the male die, in which the greater part or the whole of the profile of the bar to be bent is formed and in which the greatest gathering or stretching of the web takes
55 place.

In Fig. 3 is shown a sectional male die, the

sections thereof being indicated by the reference characters B', B³, and B⁵. The section B⁵ is shown as separate from the sections B' B³. The sections of the die shown in Fig. 3
60 are connected together through the medium of the nut and bolt C.

In Fig. 4 a modified form of male die is shown and which is indicated by the reference character B⁷, and combined with the
65 male die B⁷ is a laterally-operating plunger D to press or straighten the web, as needed. While this form of mechanism is adapted for the purpose designed, it is obvious that other forms of compressing mechanism may be em-
70 ployed and still be within the scope of the invention.

The male die is provided with a plurality of channels F to receive the flange or flanges of the metal bars being bent. These chan-
75 nels are of greater depth than the height of the flanges, thus to allow the latter to be bent at the proper angle and also to afford room for the surplus metal formed at the inner angle of the bend. The male die is further pro-
80 vided intermediate of the channels F with a projection G, which is provided for the purpose of engaging the web and forcing it down into the female die, and thereby present a finished bend.
85

Referring to Fig. 5, D' designates a closing-press for securing the exact angle and sharpness to the work desired and may be employed for varying angles. E is the female die, which is usually plain, and E' is the mov-
90 able or hinged element, which is actuated by the closing member D', as above stated.

In most cases, especially in heavy work, the bars are worked hot. As shown in the drawings, the blocks or dies are adapted for
95 inner angles where the webs gather; but it will be obvious that blocks or dies may be employed for forming angles where the webs are stretched, in which case the profiles are formed almost entirely in the block or die E
100 instead of the block or die B, as shown.

Having thus described the invention, what I claim is—

A machine for bending angle, T and channel irons at right angles, comprising a recip-
105 rocatory male die having an angular working face and a stationary female die having an angular working face, said male die provided with a plurality of channels intermediate its ends for the reception of a flange or flanges of
110 the iron, and further provided intermediate the channels thereof with a web-engaging

member projecting beyond the face of the
portion of the die interposed between the
channels and the web-engaging member, said
channels being of greater height than the
5 height of the flange of the iron to be bent to
form spaces for the reception of the surplus
metal formed at the angle of the bend during
the operation of bending.

In testimony whereof I have hereunto set
my hand in the presence of two subscribing 10
witnesses.

THOMAS STEVENSON.

Witnesses:

HENTON MACAULAY DAVEY,
ELIZABETH ANN DAVEY.